REMARKS

Status of Claims

Claims 1-2 and 4-48 are pending in this application, with claims 1, 14, 19, 28, 36, 43 and 46-48 being independent. Claims 11-18 and 24-25 have been withdrawn due to a restriction requirement. Applicants note with appreciation the indication of allowable subject matter of claims 8-10.

Claims 1, 4 and 19 have been amended to correct informalities in the claim language and to more clearly define the claimed subject matter. Claim 3 has been cancelled without prejudice. Claims 26-48 have been added. Support for the amendments and the new claims is found, for example, at FIGS. 1 and 2, the corresponding description of the specification, and at paragraphs [0084], [0085] and [0087] of the present specification. Care has been taken to avoid introducing new matter.

For the reasons set forth below, Applicant respectfully submits that all pending claims as currently amended are patentable over the cited prior art.

Claim Objections

Claims 1 and 19 were objected to for minor informalities. Applicants respectfully submit that the amendments made to claims 1 and 19 overcome this objection.

Claim Rejection - 35 U.S.C. §112

Claims 3-4 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Since claim 3 has been cancelled, this rejection of claim 3 is moot. Claim 4 has been amended to

depend upon claim 1. Applicants respectfully submit that these amendments overcome this rejection.

Claim Rejection - 35 U.S.C. § 102 and 103

Claims 1, 5, 19, 20, 22 and 23 were rejected under 35 U.S.C. § 102(e) as being anticipated by Duan et al. (USP 7,067,867) Claims 2, 6, 7, 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Duan. Applicants respectfully traverse these rejections for at least the following reasons.

Applicants respectfully submit that, at a minimum, Duan fails to disclose that "*the insulating layer covers the surface of the channel region but does not cover the surface of the contact regions and the channel region and the contact regions are adjoined along an axis direction of the nanowire*" as recited by amended claims 1 and 19.

The Examiner asserts that "Duan discloses in Figs. 3A-3D the insulating/dielectric layer 304 covers the surface of the channel region/doped surface layer 302 of the nanowire 330 but does not cover the surface of the contact regions/end portions of the nanowire 330 which is a part of a uniformly doped single crystal nanowaire 330." However, Figs 3A-3D do not show at least the channel region. The layer 302 (i.e., alleged channel region) is a doped surface layer which can separate impurities from a conducting channel of the nanowire (see, col. 14, lines 9-13 of Duan). As such, it is clear that Duan fails to disclose that the doped surface layer 302 is a channel region. Accordingly, Figs. 3A-3D do not teach or suggest that "*the insulating layer covers the surface of the channel region but does not cover the surface of the contact regions*" as recited by claims 1 and 19.

In addition, Figs. 3A-3D show only the core-shell nanowire. The doped surface layer 302 (alleged channel region) is formed on the surface of the nanowire 310 (including alleged contact regions) as shown in Figs. 3B-3D. As such, it is clear that Duan does not teach or suggest that "*the channel region and the contact regions* ***are adjoined along an axis direction of the nanowire***" as recited by claims 1 and 19.

It is also submitted that since the layer 302 is a mere doped layer of nanowires 310, 320 or 330 (see, page 14, lines 8-33 of Duan), Duan fails to disclose that the layer 302 (alleged channel layer) is made of the first semiconductor material and the nanowires 310, 320, 330 (alleged contact region) are made of the second semiconductor material different from the first semiconductor material.

Further, in Fig. 4B of Duan, although a first portion 404 doped with an n-type characteristic appears to be connected to a second portion 406 doped with a p-type characteristic, this figure merely discloses that the alleged contact layers of the first portion and second portion are connected. It is clear that this figure fails to disclose that "*the insulating layer covers the surface of the channel region but does not cover the surface of the contact regions and the channel region and the contact regions are adjoined along an axis direction of the nanowire*" as recited by claims 1 and 19.

Based on the foregoing, Applicants respectfully submit that, at a minimum, Duan fails to disclose the above identified features of claims 1 and 19. Further, it would not have been obvious to add such features to Duan. Accordingly, claims 1 and 19 and all claims dependent thereon are patentable over Duan.

Regarding claim 2, the Examiner asserts that the use of Si_xGe_{1-x} (where $0<x\leq1$) as the first semiconductor material and Si_yGe_{1-y} (where $0\leq y<1$ and $x\neq y$) as the second semiconductor material would be an obvious selection. However, the Examiner fails to indicate reasonable grounds for his assertion. Although the Examiner asserts that to select a known material on the basis of its suitability for the intended use is within the general skill, claim 2 does not recite these materials as an intended use. The Examiner also fails to point out how these materials are suitable for the claimed subject matter. Applicants respectfully submit that the Examiner is required to provide documentary evidence to support the examiner's conclusion. As such, it is submitted that claim 2 is patentable over the cited reference for its own merit in addition to the dependency upon claim 1.

Furthermore, in rejecting claims 6, 7 and 21, the Examiner asserts that discovering an optimum value of a result effective variable is within routine skill in the art. Applicants submit that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation" (emphasis added). *See*, M.P.E.P. 2144.05. Since the cited reference fails to recognize the length of the channel region or conductivity as a result-effective variable, the Examiner's assertion has no merit. As such, it is submitted that claims 6-7 and 21 are patentable over the cited reference for their own merits in addition to the dependency upon claims 1 or 19.

Based on the foregoing, it is respectfully requested that the Examiner withdraw the rejections of claims 1-2, 4-7 and 11-23 under 35 U.S.C. § 102(e)/103(a).

New Claims

Since new claims 26 and 27 depend upon claim 1 and claim 19, respectively, these claims are patentable over the cited reference for at least the same reasons as claims 1 and 19.

New independent claims 28 and 36 recite that "*the insulating layer covers the surface of the channel region but does not cover the surface of the contact regions, and the first semiconductor material and the second semiconductor material are different and capable to form thermal oxide films with mutually different etch properties.*" Although Fig. 4B of Duan appears to disclose that the first portion 404 and the second portion 406 have different conductivities, the first portion and second portion are formed by same semiconductor material, which would form oxide having the same etch property. As such, claims 28 and 36 and all claims dependent thereon are patentable over Duan.

New independent claims 43 and 46 recite all limitations of allowable claim 8. Therefore, claims 43 and 46 and all claims dependent thereon are patentable.

New independent claims 47 and 48 recite that "*the contact regions are made of a second semiconductor material, which is different from the first semiconductor material for the channel region*" and "*the insulating layer is formed by thermally oxidizing the surface of the channel region*" which is recited in original claim 4. It is clear that, at a minimum, Duan fails to disclose or suggest these features of claims 47 and 48. Therefore, claims 47 and 48 are patentable over Duan.

Conclusion

Having fully responded to all matters raised in the Office Action, Applicant submits that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicant's attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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